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(54) **STROLLER BRAKE SYSTEM**

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B62B 9/08 (2006.01)

(52) **U.S. Cl.** **280/47.38**; 188/20

(58) **Field of Classification Search** ..... 280/47.38, 280/642, 647, 650, 657, 658; 188/20; 16/35 R
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,116,464	A	9/1978	Haley	
4,618,033	A *	10/1986	Kassai	188/20
5,125,676	A *	6/1992	Teng	280/47.36
5,215,320	A *	6/1993	Chen	280/47.36
5,351,364	A *	10/1994	Zun	16/35 R
5,370,408	A *	12/1994	Eagan	280/33.994
5,460,399	A *	10/1995	Baechler et al.	280/650
5,709,400	A	1/1998	Bonnier et al.	
5,927,441	A *	7/1999	Luo	188/19
6,099,022	A	8/2000	Pring	
6,170,615	B1 *	1/2001	Cheng	188/20
6,193,263	B1	2/2001	Lin	
6,203,054	B1	3/2001	Matsumoto	
6,209,892	B1	4/2001	Schaaf et al.	
6,398,233	B1	6/2002	Liang et al.	

(Continued)

FOREIGN PATENT DOCUMENTS

BE	436 168	8/1939

(Continued)

OTHER PUBLICATIONS

International Search Report and Written Opinion issued in related International application No. PCT/07/65895 mailed Sep. 6, 2007.

(Continued)

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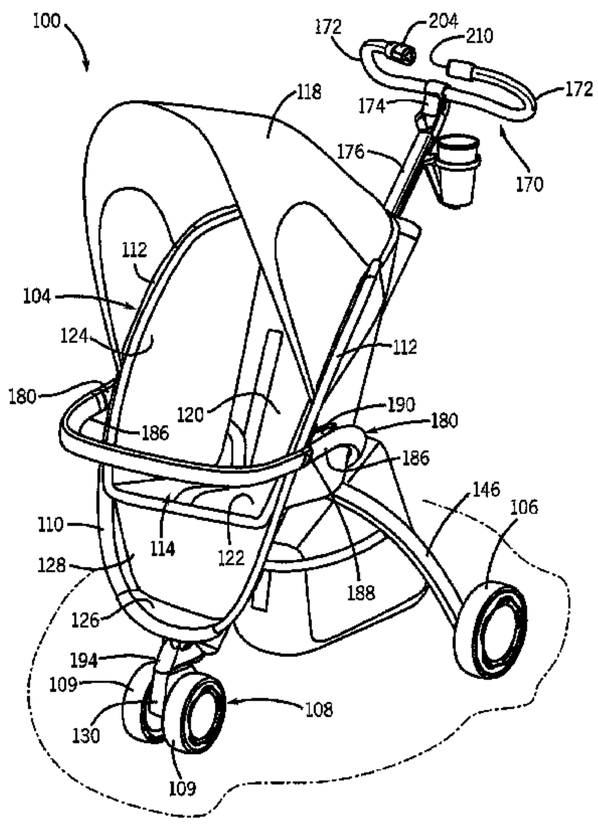
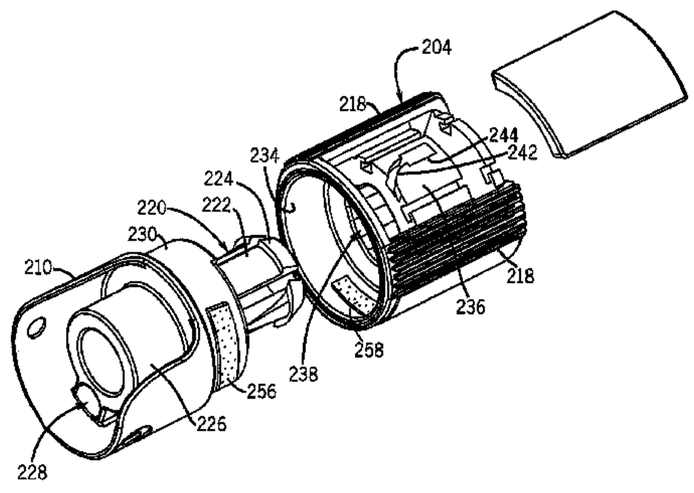
(57) **ABSTRACT**

A stroller is provided having a stroller frame supported by at least one wheel and a handle. The handle includes a brake operator that is coupled to a brake assembly at the wheel. The brake operator is movable between a first position whereby the brake assembly is disengaged from the wheel, and a second position whereby the brake assembly engages the wheel to retard the wheel motion.

17 Claims, 11 Drawing Sheets





U.S. PATENT DOCUMENTS

6,446,990	B1	9/2002	Nania et al.	
6,561,537	B1 *	5/2003	Chen	280/648
6,584,641	B1 *	7/2003	Milbredt	16/35 R
6,817,451	B1 *	11/2004	Chen	188/20
7,213,818	B2 *	5/2007	Chang	280/47.38
7,396,038	B2	7/2008	Zweideck	
2005/0140105	A1	6/2005	Hernandez	
2005/0167952	A1 *	8/2005	Lin	280/650
2006/0001226	A1	1/2006	Refsum	
2006/0043688	A1	3/2006	Chang	
2006/0145446	A1	7/2006	Schmider	

FOREIGN PATENT DOCUMENTS

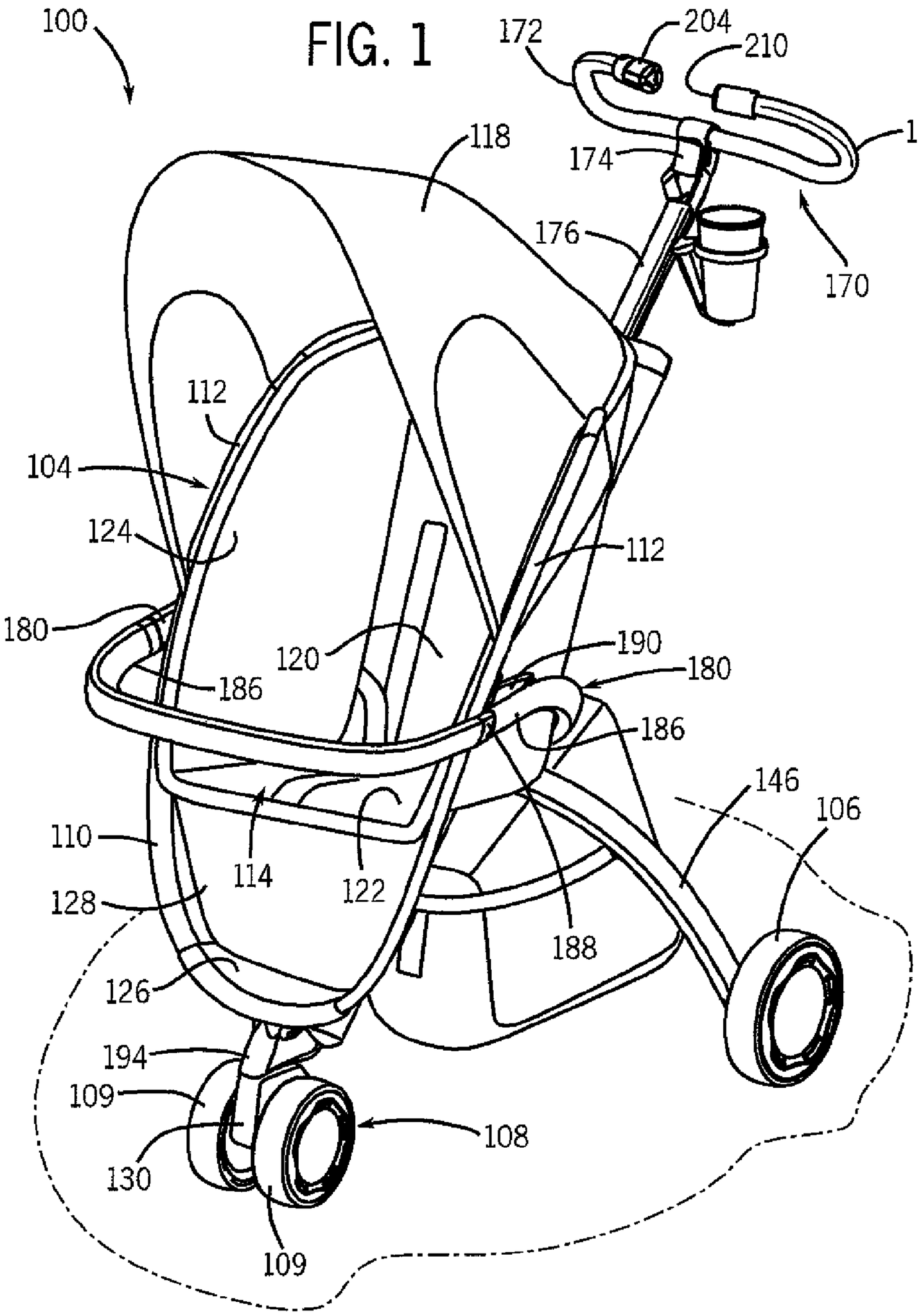
CH	174000	12/1934
CN	2064435 U	10/1990
DE	299 07 287	7/1999
DE	102 06 785	10/2003
GB	595 877	12/1947
GB	607 858	9/1948
GB	2 219 054	11/1989
GB	2 403 899	1/2005

OTHER PUBLICATIONS

Britax Preview Lightweight Umbrella Travel System (Jun. 2004).

* cited by examiner

FIG. 1


100
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126
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130
109

FIG. 2

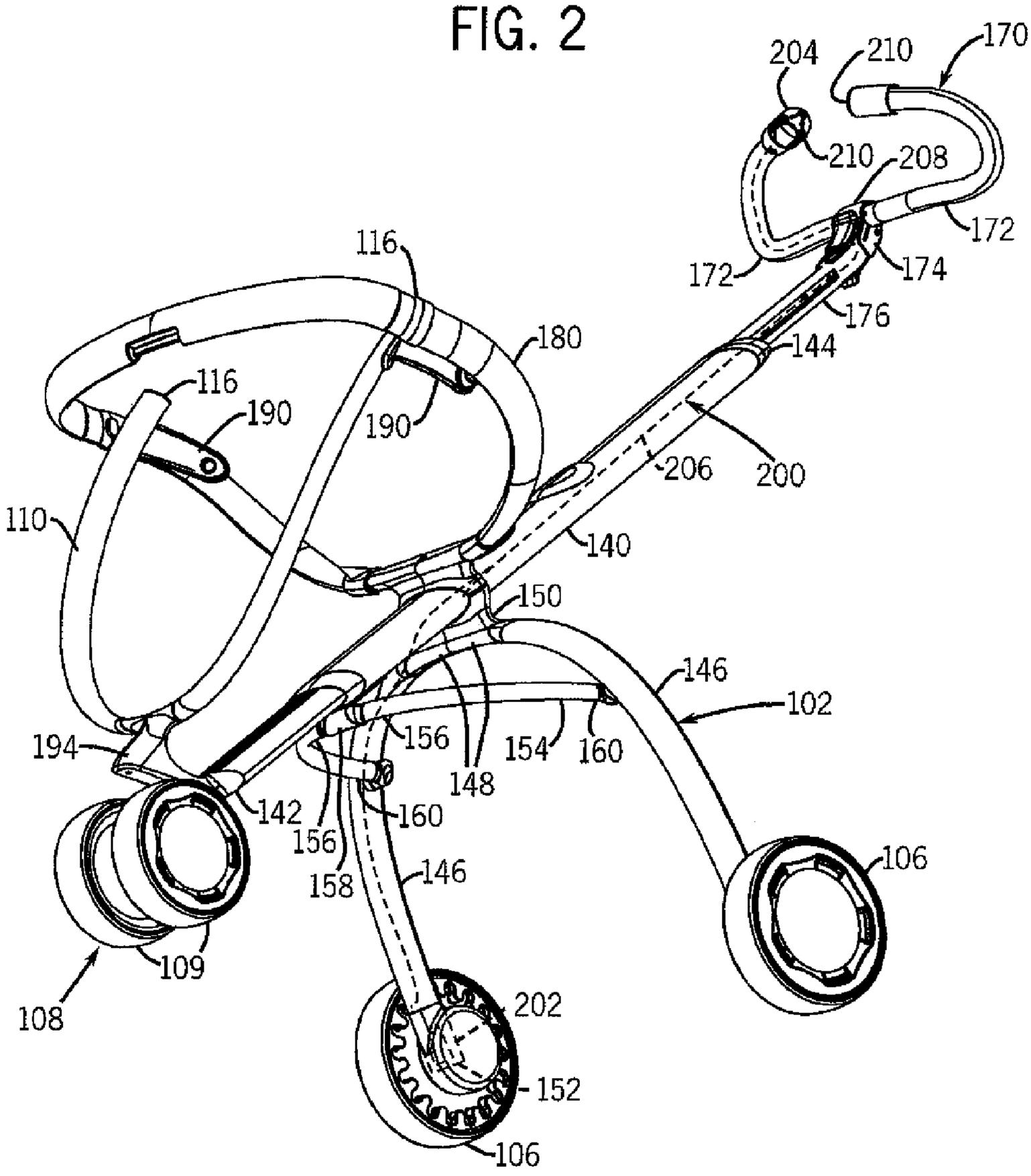
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FIG. 3

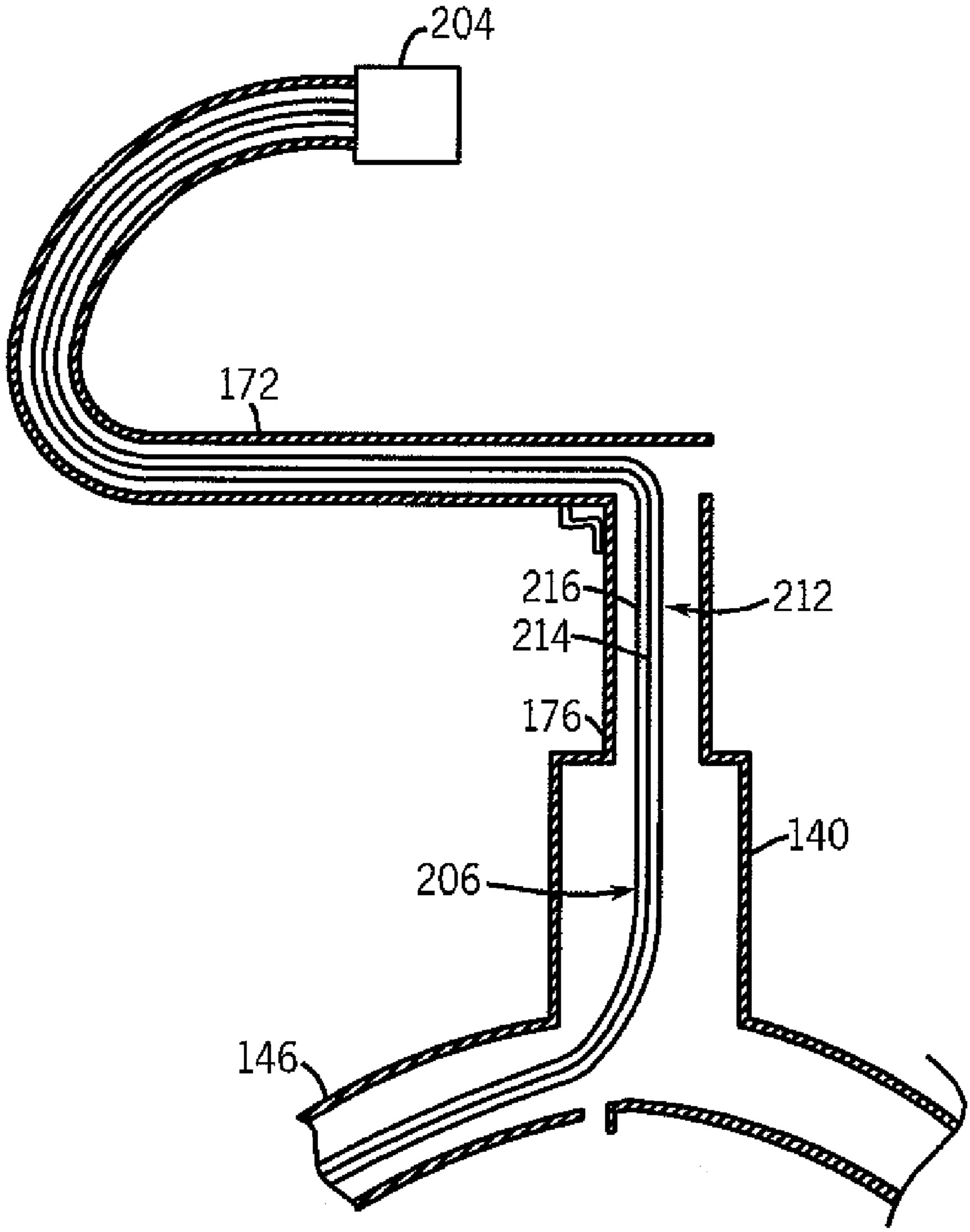

FIG. 4

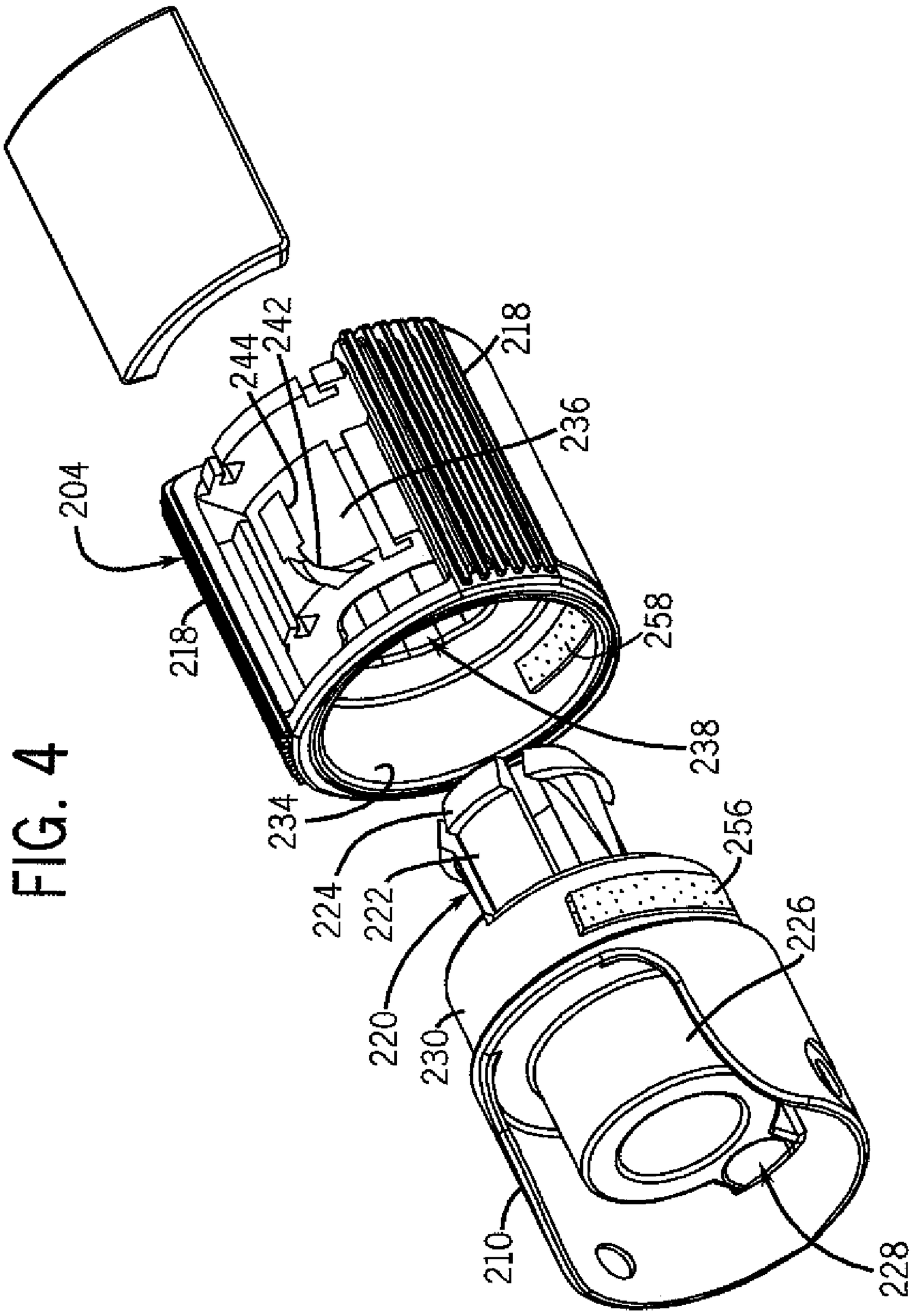
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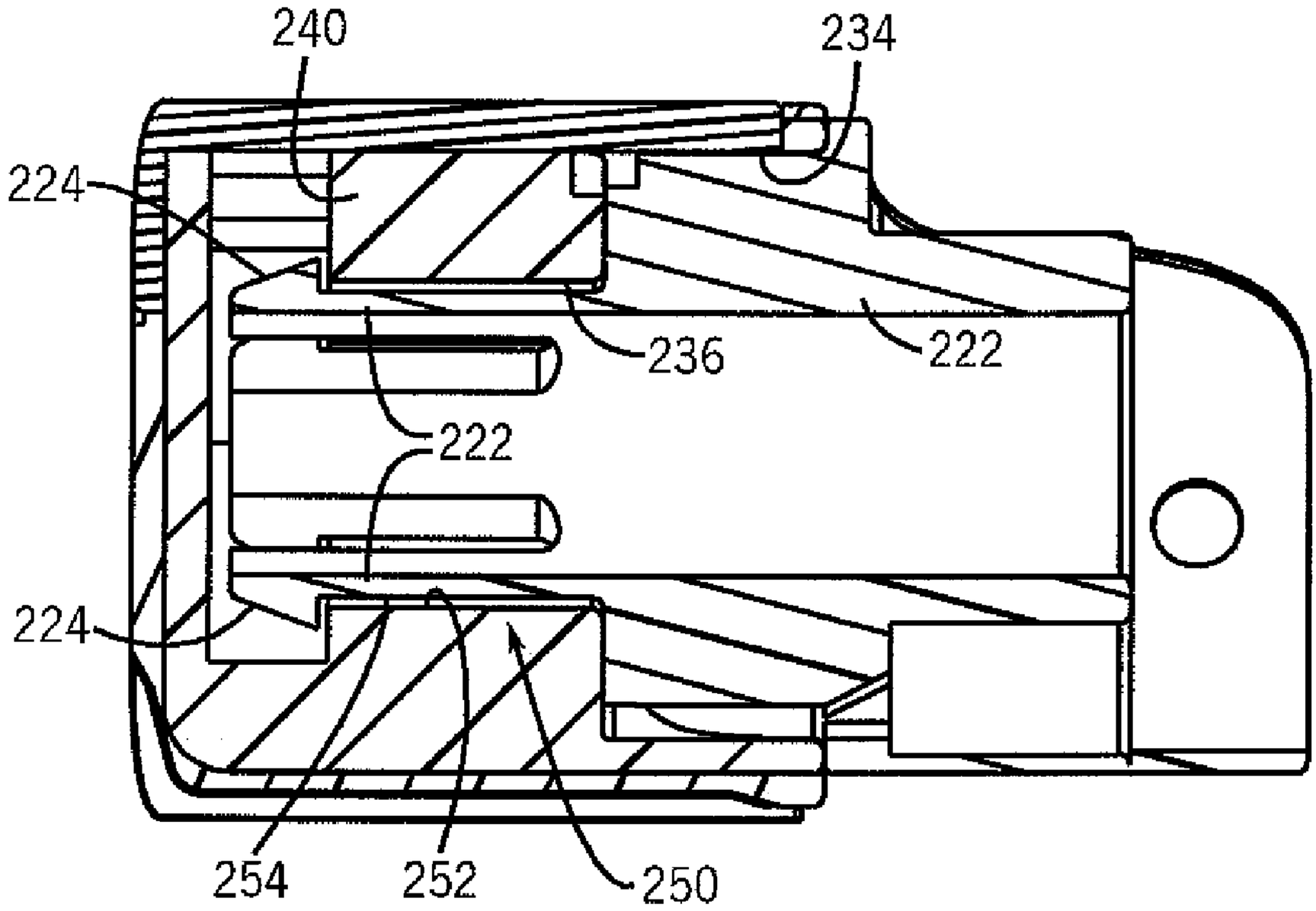
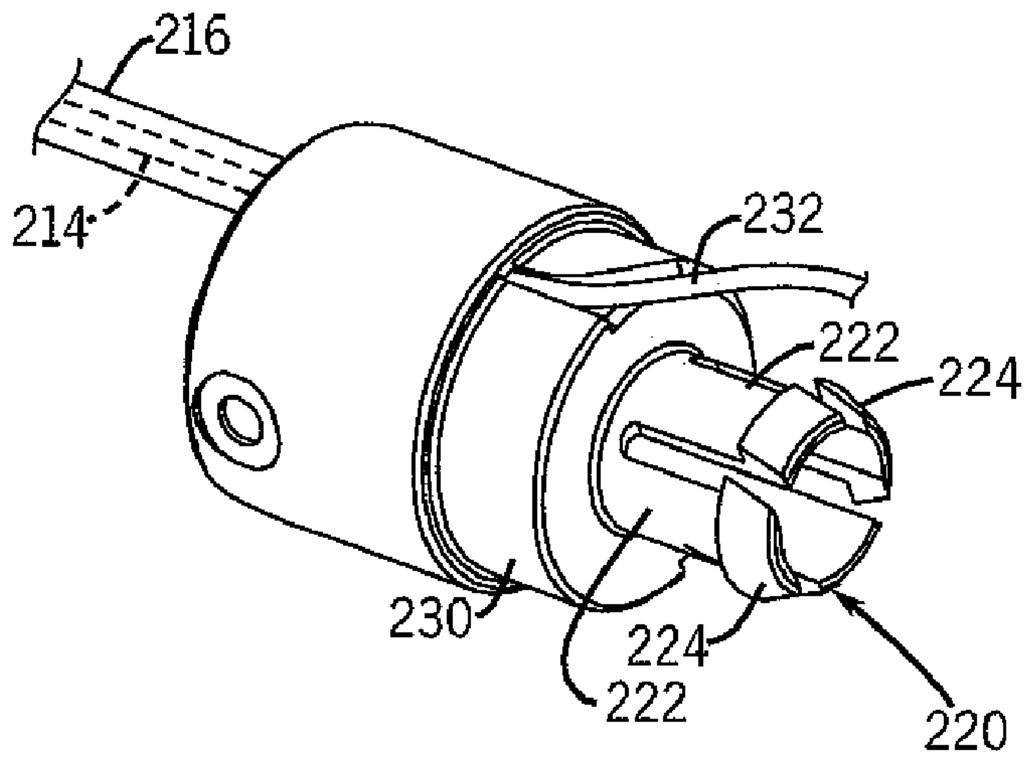
FIG. 5




216
214
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222
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230
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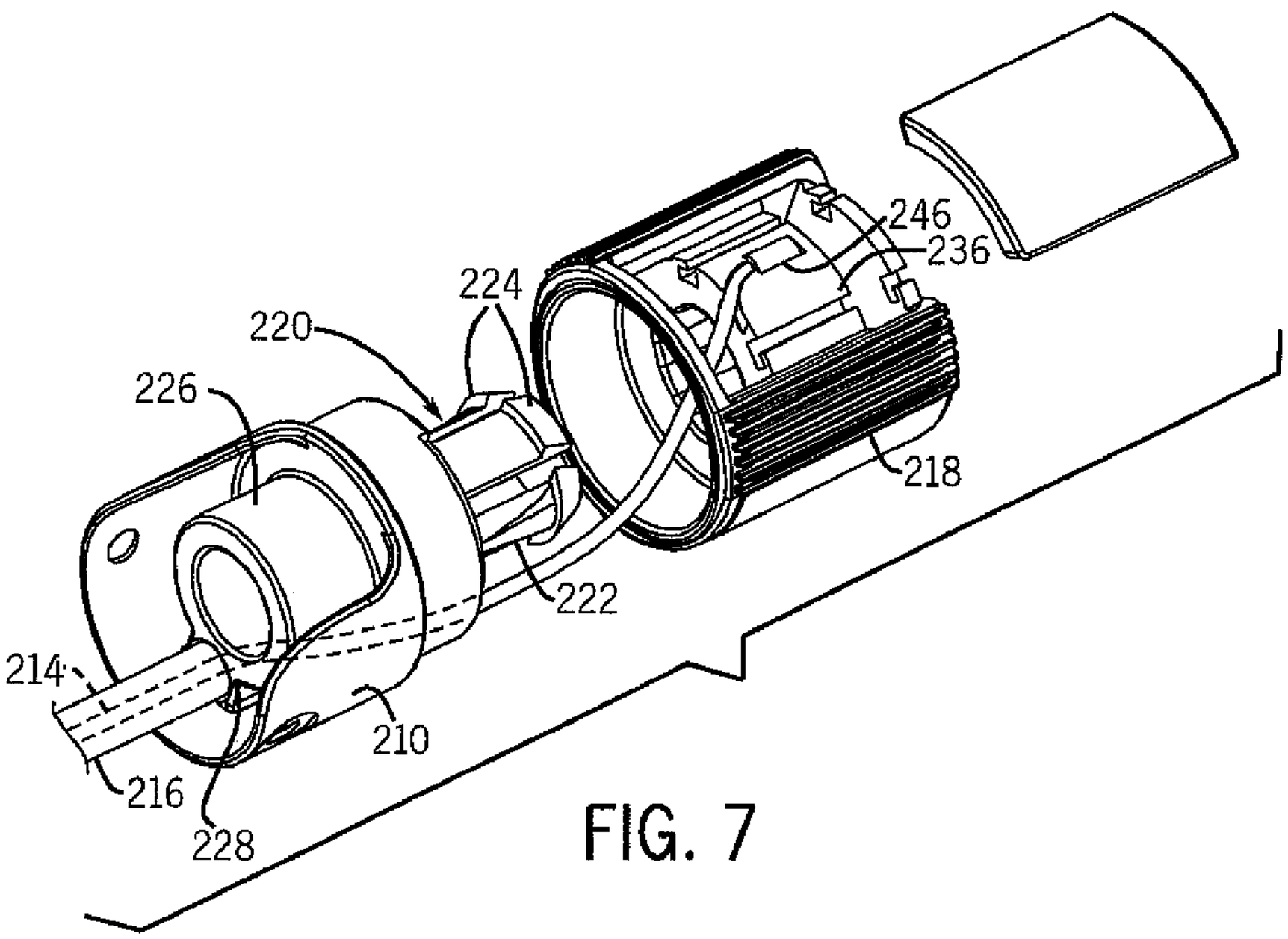
222
220

FIG. 6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236
224
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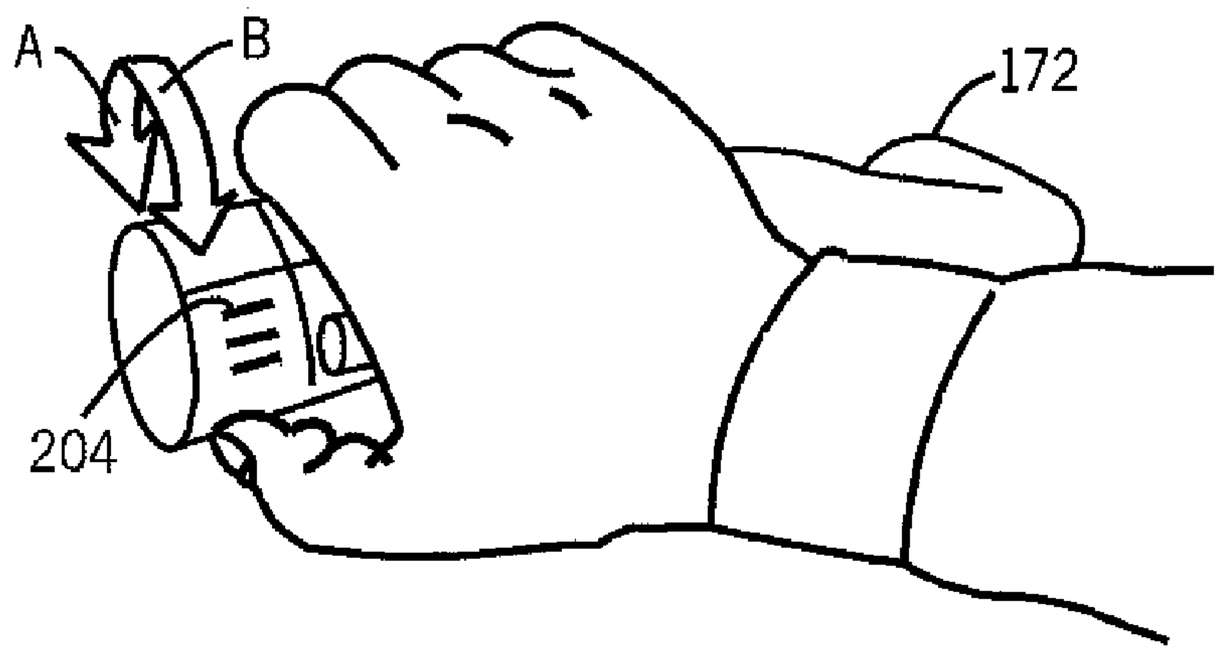
228

FIG. 7

FIG. 8



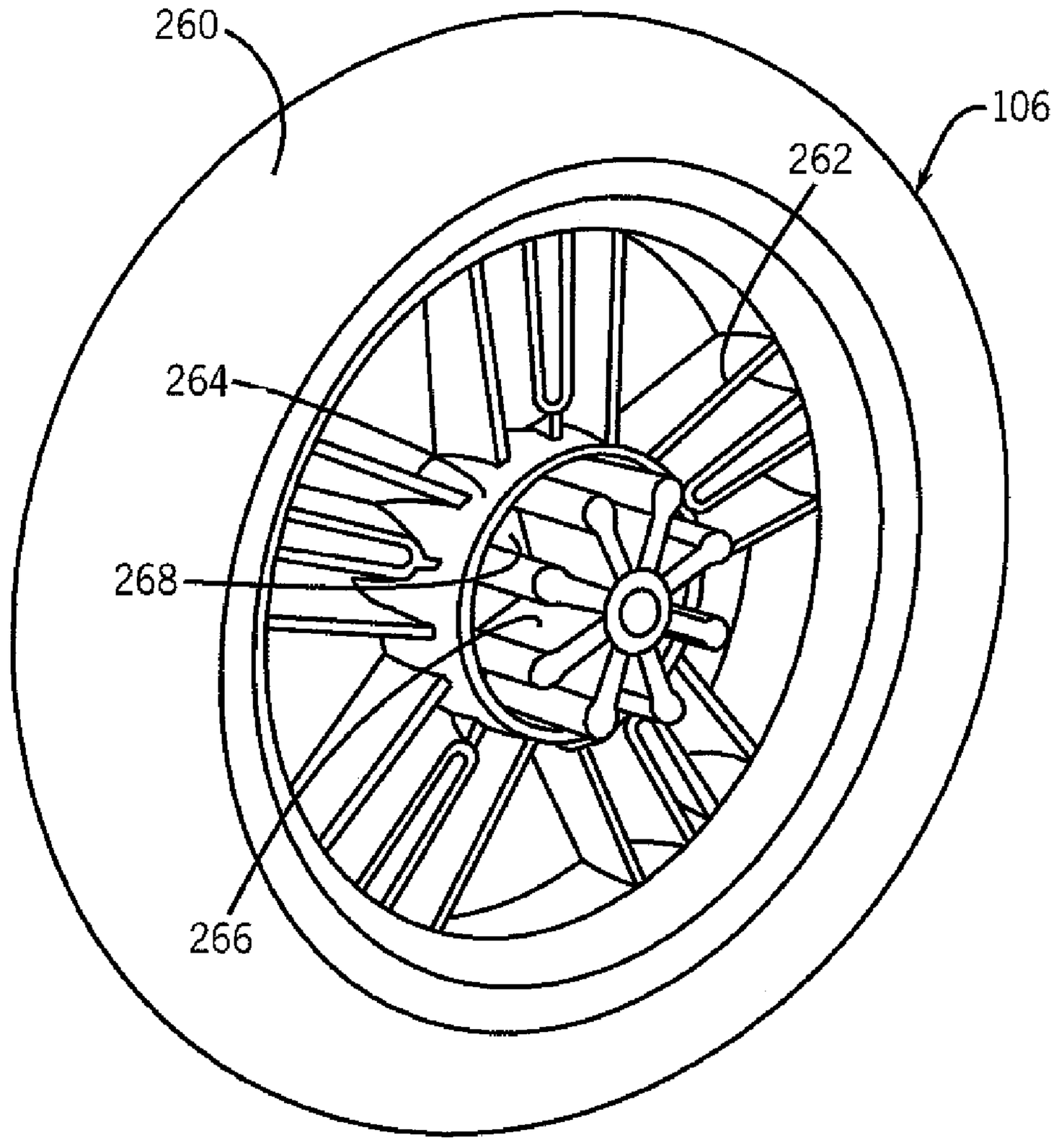
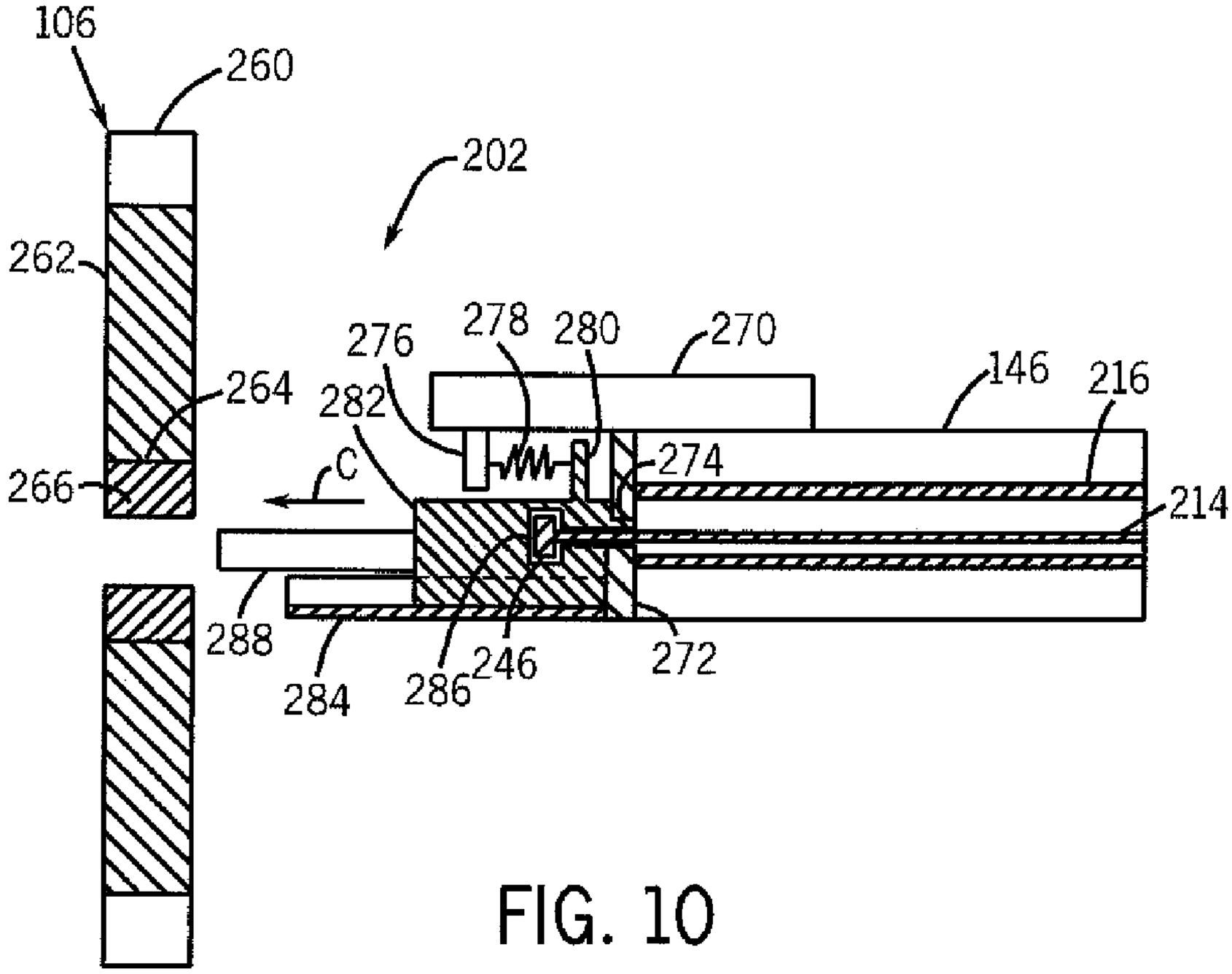


FIG. 9


106
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202
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FIG. 10

FIG. 11

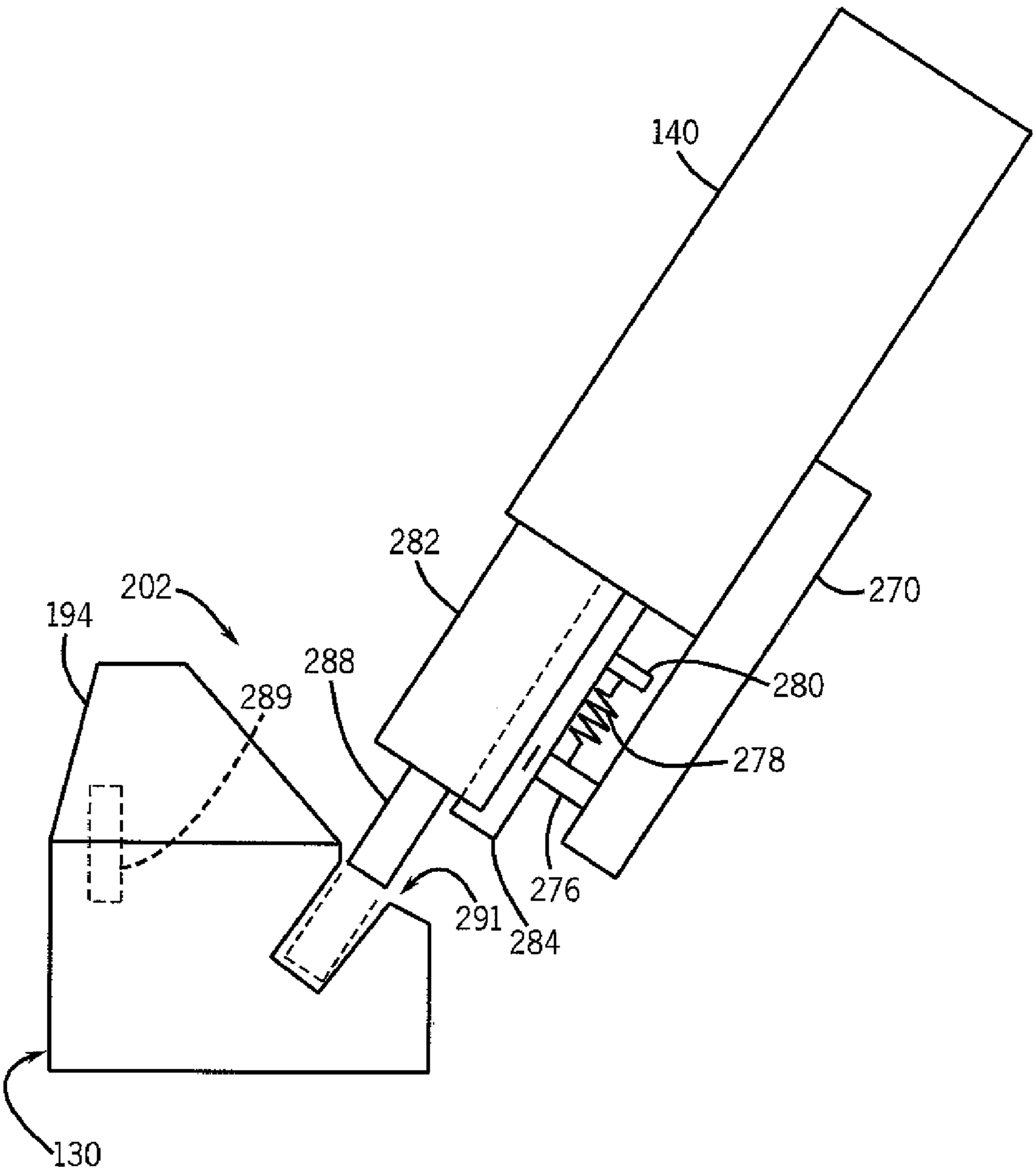
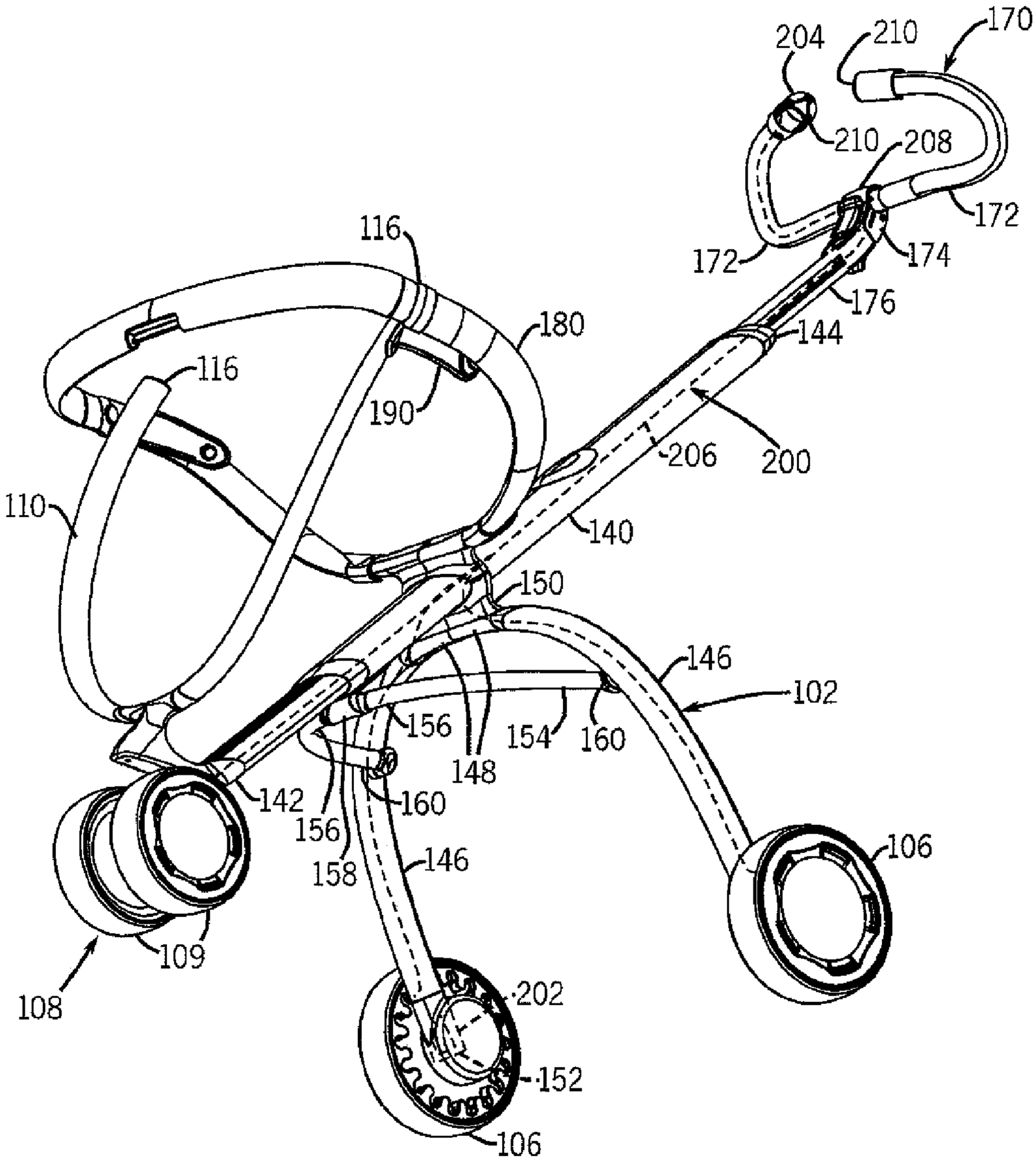


FIG. 12A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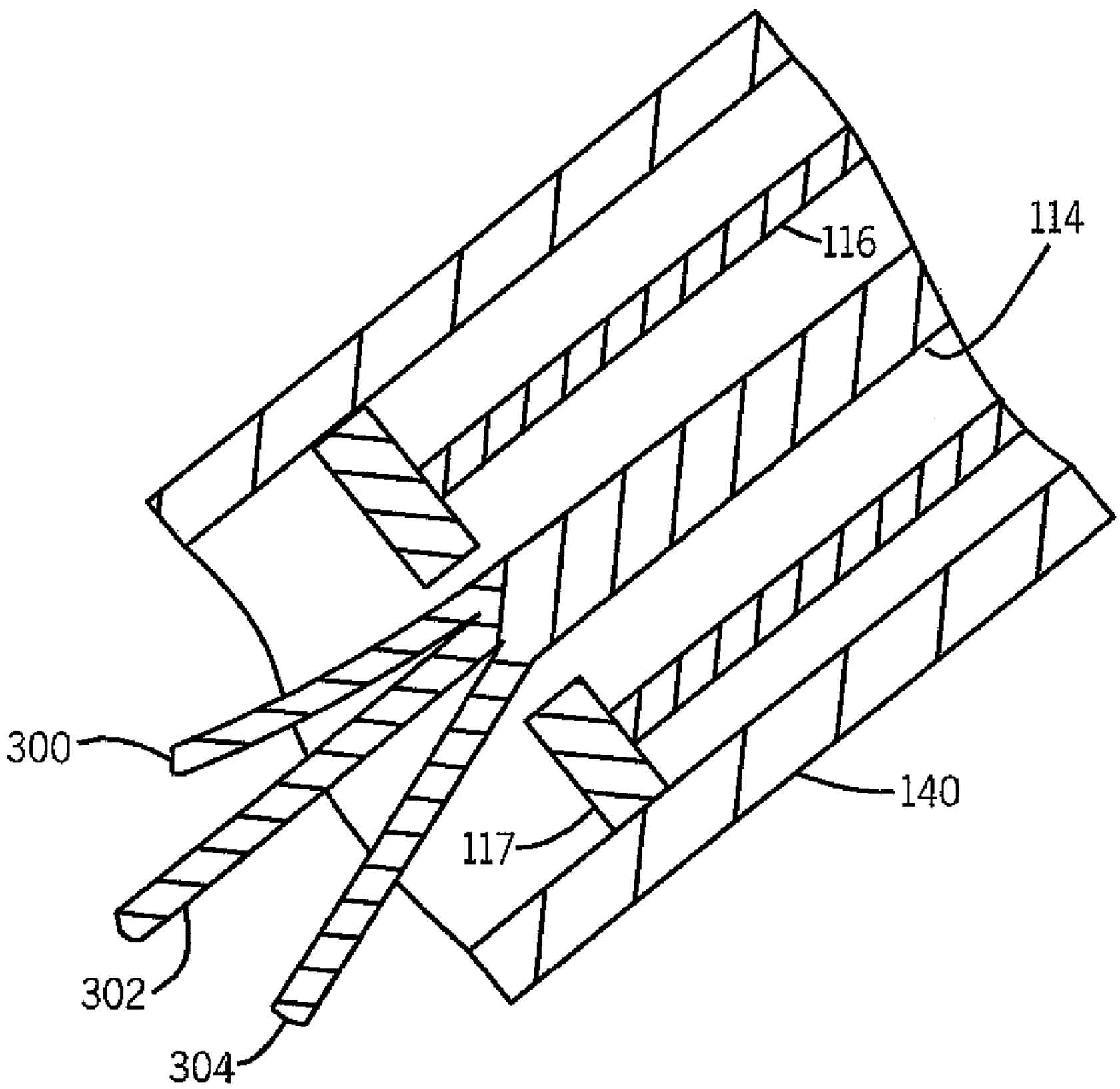

FIG. 12B

STROLLER BRAKE SYSTEM

RELATED APPLICATION DATA

This application claims the benefit of provisional application No. 60/789,240 filed Apr. 3, 2006, the disclosure of which is hereby incorporated by reference as if set forth in its entirety herein.

BACKGROUND OF THE INVENTION

1. Field of the Disclosure

The present disclosure is generally directed to strollers, and more particularly to a braking system for a stroller.

2. Description of Related Art

Well-designed strollers should be sturdy and balanced, and should provide the child passenger with safe and comfortable transport. Throughout the development of strollers, an effort has been made to include features that render the stroller versatile and convenient. Efforts have been made to provide these features while achieving a simple design, yet maintaining the stroller rugged and reliable.

A conventional stroller has a plurality of wheels supporting a frame that supports one or more stroller seats. The frame has two spaced front legs, two spaced rear legs, one or more push arms, and a crossbar connected at its laterally outer ends to the push arms. The crossbar can be provided with a pair of laterally spaced gripping surfaces that can be engaged by a caregiver when driving the stroller, and a handle assembly disposed between the gripping surfaces.

Some conventional strollers a braking system that enables a caregiver to lock at least one of the wheels to prevent the stroller from rolling along the ground surface. Braking systems include an actuator that can be moved with the foot or hand of the caregiver to, in turn, cause a braking member to interlock with at least one of the wheels to prevent the wheel from rotating. The frictional forces between the locked wheel and the ground prevent the stroller from easily moving along the ground. Unfortunately, hand operated braking systems require the caregiver to remove at least one hand from the stroller handle. Foot operated braking systems require the caregiver to divert his or her attention from the child and surrounding environment. Furthermore, conventional braking systems are cumbersome and inconvenient to operate.

What is therefore needed is a braking system for a stroller that is easy to access and operate relative to conventional stroller braking systems.

SUMMARY

In accordance with one aspect of the present invention, a stroller is provided having a stroller frame supported by at least one rotatable wheel. A handle is coupled to the frame. The handle includes a brake operator that is movable between a first brake position and a second release position. A brake assembly is supported by the frame and operably coupled to the wheel. A motion transfer mechanism operably couples the brake operator and the brake assembly. Movement of the handle to the brake position causes the brake assembly to retard movement of the wheel.

It should be appreciated that the foregoing and other aspects of the invention will appear from the following description. In the description, reference is made to the accompanying drawings which form a part thereof, and in which there is shown by way of illustration, and not limitation, preferred embodiments of the invention. Such embodiments do not necessarily represent the full scope of the invention, and reference must therefore be made to the claims herein for interpreting the full scope of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Objects, features, and advantages of the present invention will become apparent upon reading the following description in conjunction with the drawing figures, in which:

FIG. **1** is a perspective view of an exemplary stroller constructed in accordance with the principles of the present invention;

FIG. **2** is a perspective view of the stroller frame with the seat assembly removed to illustrate a brake system having a brake operator, a motion transfer mechanism, and a brake system constructed in accordance with the principles of the present invention;

FIG. **3** is a is a schematic front elevation view of a portion of the stroller frame with portions cut away to illustrate the motion transfer mechanism;

FIG. **4** is an exploded assembly view of the operator and handle of the stroller frame;

FIG. **5** is a sectional side elevation view of the operator connected to the handle;

FIG. **6** is a perspective view of the handle coupled to the motion transfer mechanism;

FIG. **7** is a partially assembled view of the operator and handle coupled to the motion transfer mechanism;

FIG. **8** is a perspective view schematically illustrating the operation of the brake operator;

FIG. **9** is a perspective view of a stroller wheel engaged by the brake system;

FIG. **10** is a sectional side elevation view of the brake system;

FIG. **11** is a sectional side elevation view of a brake system constructed in accordance with an alternative embodiment;

FIG. **12**A is a perspective view of a stroller frame similar to that illustrated in FIG. **2**, but with the brake system constructed in accordance with an alternative embodiment; and

FIG. **12**B is a perspective view of a portion of the motion transfer mechanism illustrated in FIG. **12**A.

DETAILED DESCRIPTION OF THE DISCLOSURE

The disclosed stroller improves upon one or more of the above-noted problems and/or disadvantages in the prior art. For instance, the stroller includes a frame supported by at least one wheel for movement along a ground surface. The stroller frame includes a handle that is grasped by the caregiver to push and maneuver the stroller. The frame further carries a brake system that includes a brake operator that can be actuated by the caregiver to lock and unlock brake assembly that is operable to selectively retard or prevent movement of the stroller wheel. The brake system further includes a motion transfer mechanism that operatively couples the brake operator to the brake assembly. Advantageously, the brake operator is carried by the handle, and can be positioned to be accessible the caregiver without removing both hands from the handle and without diverting his or her attention from the child and surrounding environment.

Turning now to the drawings, a stroller **100** is depicted in FIGS. **1-2**, and is constructed in accordance with the teachings of the present invention. In the disclosed example, the stroller **100** generally has a stroller frame **102**, a seat assembly **104** supported by the frame **102**, and a plurality of wheels supporting the frame **102** on a ground surface. In general, the frame **102** in the disclosed example includes a pair of rear

wheels **106** and a single front wheel assembly **108** positioned forward of and at a mid point between the rear wheels. In this example, the front wheel assembly has two wheels **109** spaced apart side by side. The wheels **109** are connected to the spine **140** via a support **130** that is pivotally connected to the lower end **142** of the spine in the usual manner, such that the angular orientation of the front wheel assembly **108** can change to enable easy stroller steering, as appreciated by one having ordinary skill in the art.

The frame **102** in this example generally has a seat mounting frame **110** that is a U-shaped component. In the disclosed example, the seat assembly **104** can be removed from the seat frame **110** and the stroller **100**. In general, the removable seat assembly **104** includes a pair of seat attachment tubes **112** positioned on opposite sides of an occupant seat **114**. The seat tubes **112** are connected to and can be removed from upper ends **116** of the seat frame **110**. The seat **114** of the seat assembly **104** is supported on the stroller at least in part by the seat tubes **112** and has a canopy **118** connected to an upper part of the seat. The seat **114** also has a seat back **120**, a seat bottom **122**, and seat side wings **124** positioned on opposite sides of the seat back and the seat bottom.

A footrest **126** is positioned at the bottom of the seat assembly **104** and is suspended from the front edge of the seat bottom **122** by a mesh fabric panel **128** in this example. The footrest **126** is also connected to the lower part of the seat frame **110**. In the disclosed example, the seat **104** can be made entirely of fabric or like materials and be suspended from the seat tubes **112** and the seat frame **110**, when attached. Alternatively, portions of the seat assembly **104** can have a removable cover placed over a generally rigid supporting structure that defines and shapes at least part of the seat, such as the seat bottom **122** and parts of the seat side wings **124**. Thus, once attached to the seat frame **110**, the seat assembly **104** can be sufficiently supported on the stroller and substantial enough to support the weight of a child occupant. As will be evident to those having ordinary skill in the art, the configuration and construction of the seat assembly **104** and the seat **114** can vary considerably and yet fall within the spirit and scope of the present invention.

The stroller frame **102** in the disclosed example generally has a central spine **140** with a lower end **142** positioned near the front wheel assembly **108**. The spine **140** also has an upper end **144** positioned behind the seat back **120** of the seat assembly **114** and between the rear wheels **106**. A pair of curved rear legs **146** extends downward in opposite directions from an underside of the spine **140**. Each leg **146** is bowed outward and extends in a rearward and downward direction. A proximal or top end **148** of each leg **146** is coupled to a rear leg connector **150** positioned on the underside of the spine **140**. The connector **150** is positioned in this example about midpoint between the upper end **144** and the lower end **142** of the spine **140**. A distal or lower end **152** of each rear leg **146** in this example carries one of the rear wheels **106**.

A rear leg link **154** is positioned on each side of the frame **102** and links each rear leg **146** to the spine **40**. Each link **154** has one end **156** coupled to a connector **158** on the underside of the spine **140** positioned below the rear leg connector **150** along the spine. Each link **154** also has another end **160** coupled to a corresponding one of the rear legs **146**. The links **154** provide stability for the stroller frame **102**, and particularly for the rear legs **146**, during use.

The stroller **100** disclosed herein has a pair of curved seat frame support arms **180**. The support arms **180** extend upward in opposite directions from the top side of the spine **140**. Each support arm **180** is bowed outward and extends in a forward and upward direction relative to the spine **140**. A proximal or bottom end **182** of each support arm **180** is coupled to a support arm connector **184** positioned on the top side of the spine **140**. The support arm connector **184** in this example is positioned at the same location along the spine as the rear leg connector **150**, which is on the underside of the spine. A distal end portion **186** of each support arm **180** is bent downward, extends generally horizontally forward, and terminates at an exposed end or face **188**.

In this example, a seat frame link **190** is positioned on each side of the seat frame **110** and extends in a rearward direction. Each seat link **190** is coupled to one of the support arms **180**. The connection point between each seat link **190** and the respective support arm **180** in this example is spaced rearward from the exposed end **188** along the distal end portion **186**.

Also in the disclosed example, a frame bracket **194** is located at the lower front portion of the frame **102**. The frame bracket **194** is connected to the lower most portion **196** of the seat frame **110** and to the lower end **142** of the spine **140**. The front wheel assembly **108** is mounted to and extends downward from the frame bracket **194**. The frame bracket **194** links the spine **140** to the seat frame **110** and provides the front wheel mounting location in the disclosed example.

The spine **140** is oriented centrally between the rear wheels **106** and defines a central or longitudinal axis of the stroller **100**. In the disclosed example as shown in FIGS. **1** and **2**, the spine **140** is oriented at an angle with a low point at its lower end **142** and a high point at its upper end **144**.

The frame **102** in the disclosed example also has a stroller handle **170** that can be grasped by the caregiver for pushing and maneuvering the stroller **100**. The handle **170** includes a gripping surface that can comprise a rubber or other elastomeric material comfortably engaged by a user. The disclosed handle **170** generally has an upward facing, open C-shape that forms two handle sections **172**. The two sections **172** extend in opposite directions from a handle bracket **174**. The handle bracket **174** is coupled to a stanchion **176** that extends from the upper end **144** of the frame spine **140**. In the disclosed example, the stanchion **176** is essentially a linear structure and extends parallel to and is aligned with the spine **140**, which is also a generally linear structure.

The spine is oriented to position the handle **170** so that a caregiver can stand behind the stroller and push the stroller in a conventional manner by the handle **170**. The seat assembly **104** is positioned above and forward of the spine **140** and faces forward relative to the stroller **100** away from the handle **170**. However, the arrangement of the seat and frame components disclosed herein can vary and yet fall within the spirit and scope of the present invention. Additionally, the shape, size, configuration, orientation, and location of the various frame and seat assembly components can also vary from the example shown without departing from the spirit and scope of the present invention.

Advantageously, as illustrated in FIG. **2**, the stroller frame **102** supports a brake system **200** that includes a brake assembly **202** associated with at least one of the wheels, for instance one of the rear wheels **106**, a brake operator **204** connected to the handle **170**, and a motion transfer mechanism **206** operably coupling the brake operator **204** and a brake assembly **202**. The brake operator **204** can be actuated by the caregiver to lock and unlock the brake assembly **202** and thus retard or prevent movement of the associated wheel as desired. When the brake assembly **200** is in a locked position, movement of the associated wheel **106** is retarded or prevented. When the brake assembly **202** is in an unlocked position, the wheel **106** is free to move unencumbered by the brake assembly **202**. The brake system **200** will now be described in detail.

Specifically, each handle section **172** defines opposing terminal ends **208** and **210**, respectively. The brake operator **204** is illustrated as a knob disposed at the free terminal end **210** of one of the handle sections **172**, though it should be appreciated that the brake operator **204** could alternatively be disposed at the terminal end **208** of one of the handle sections **172**, or anywhere between the terminal ends **208** and **210** of one of the handle sections **172**. The operator **204** can be described as being at an "inner" terminal end **210** relative to the position of the caregiver's hand, as when the caretaker grips the handle section **172**, the operator **204** is within reach of his or her thumb.

Referring also to FIGS. **3** and **10**, the motion transfer mechanism **206** extends between the brake operator **204** and the brake assembly **202**. The motion transfer mechanism **206** can include a cable assembly **212** including a cable **214** disposed within a corresponding sheath **216**. The cable **214** can be formed from any metal wire material, and the sheath **216** can be formed from any elastomeric material that is sufficiently robust to protect the cable **214** within the stroller frame **102**. The cable assembly **212** is connected at its proximal end to the brake operator **204**, and extends through the stanchion **176** and into the spine **140**.

In the illustrated embodiment, the cable assembly **212** extends from the brake operator **204**, through the handle section **172**, the stanchion **176**, and into the spine **140**, one of the rear legs **146**, and is connected to the brake assembly **202** associated with one of the rear wheels **106**. Specifically, the proximal end of the sheath **216** is anchored at the brake operator **204**, and the distal end of the sheath **216** is anchored at the brake assembly **202**. The cable **214** is thus free to move within the sheath **216** as the brake operator **204** is actuated. During operation, the user can actuate the brake operator **204** in one direction, which causes the cable **202** to translate and apply an unlocking force to the brake assembly. Alternatively, the brake operator **204** can be actuated in the opposing direction, which locks the brake assembly **202**.

It should be appreciated that the motion transfer mechanism **206** illustrated and described with reference to FIG. **4** is only one example of numerous alternative mechanisms, and that all such alternative mechanisms that transfer motion from the brake operator **204** to the brake assembly **202** are contemplated by the present invention.

The brake operator **204** will now be described with reference to FIGS. **4-8**. Specifically, the operator **204** is illustrated as being connected to, and extending axially from, the terminal end **210** of the handle section **172** so as to be easily accessible to the thumb of the caregiver operating the stroller **100**. The operator **204** can include a grip **218** or a plurality of radially spaced, and axially extending, grip surfaces at its outer surface that presents a texture different from that of the adjacent handle section **172** to provide the caregiver with tactile feedback that he or she is touching or actuating the operator **204**.

A finger **220** projects inwardly from the terminal end **210** of the handle section **172**, and includes a plurality of radially spaced flexible tabs **222**. Each tab **222** has a barb **224** disposed at the distal end of its radially outer surface. The barbs **224** thus each project radially outwardly from the tabs **222**. The terminal end **210** further includes an elongated interior, centrally disposed, cylindrical wall **226** and a channel **228** extending adjacent the wall **226**. The channel **228** is sized smaller than the sheath **216** but larger than the cable **214**. An elongated groove **232** is formed in a necked-down outer surface **230** of the terminal end **210**, and terminates at a location inside the operator **204**. Channel **228** and groove **232** have a greater dimension than that of the cable **214** and thus provide a channel that allows the cable **214** to extend from within the handle section **172** to the interior of the operator **204**.

The operator **204** can be in the form of a knob having an outer collar **234** that receives the necked-down outer surface **230** of the terminal end **210** of handle section **172**. The necked-down portion **30** is received by the collar **234** sufficiently loosely such that the inner surface of the collar can slide along the outer surface of the necked-down portion **230**. The collar **234** is thus joined to the terminal end **210** in a manner so as to enable relative rotation between the operator **204** and the handle section **172**.

The operator **204** includes a neck **236** extending axially between the axial outer ends of the operator. A cylindrical aperture **238** extends horizontally through the neck **236** and a radial notch **240** is formed in the neck at a location adjacent, but spaced from, the distal axial end of the neck **236**. The aperture **238** has a diameter greater than the outer diameter of the flexible tabs **222**, but smaller than the outer diameter of the barbs **224**. As the finger **220** is received in the aperture **238**, the tabs **222** flex inwardly so that the barbs **224** are also received therein. The barbs **224** are continuously inserted until the barbs **224** extend beyond the notch **240**, at which point the tabs **222** snap out such that the barbs **224** engage the notch **240**. The operator **204** is thus rotatable with respect to the handle section **172**.

The operator **204** further includes an elongated curved channel **242** extending radially into, but not through, the radially outer surface of neck **236**. The channel **242** terminates at a rectangular aperture **244**. The proximal end of the sheath **216** of cable assembly **212** is anchored at the mouth of channel **228**, and the cable **214** extends through the channel **228** and groove **232**. The cable further extends into the channel **242**. The proximal end of the cable **214** is connected to a slug **246** that is received in the rectangular aperture **244** such that the cable **214** is anchored to the operator **204** at the aperture **244**.

As best shown in FIG. **8**, during operation, as the operator **204** is rotated in a first direction relative to the handle section **172** along the direction of Arrow A, the cable **214** spools about the neck **236**, thereby drawing in the distal end of the cable **214**. As the operator is rotated in a second direction opposite the first direction (Arrow B), the cable **214** unwinds from the neck **236**, thereby allowing the distal end of the cable **214** to push outwardly.

Referring now to FIG. **8**, the brake operator **204** can include an anti-rotation mechanism **250** that prevents the operator **204** from unintentionally rotating from the unlocked position to the locked position. As will be appreciated from the description below, the brake assembly **202** includes a spring member that biases the motion transfer mechanism, and thus the operator **204**, toward the locked position. Accordingly, the operator includes a detent **252** extending radially inward from the radially inner surface of the neck **236**. The detent **252** is axially aligned with a handle detent **254** that extends radially outwardly from the radially outer surface of one of the fingers **222**. When the operator **204** is rotated to the unlocked position, the detents **252** and **254** engage and require an increased force to cause the detents to slip over and past each other. The detents **252** and **254** are circumferentially positioned such that they slip past each other when the operator **204** has been rotated to the unlocked position. The interference between the detents **252** and **254** require a predetermined to be applied to the operator **204** that is greater than that the biasing force of the spring member of the associated brake assembly in order to cause the operator **204** to rotate relative to the handle section **172** towards the locked position.

Referring again to FIG. **4**, the anti-rotation mechanism **250** can further include a friction member **256** disposed on the radially outer surface of the necked-down section **230** and a corresponding friction member **258** disposed on the radially inner surface of the collar **234**. The friction members **256** and **258** can be brought into contact and rub against each other, resisting relative motion. In accordance with one aspect of the present invention, the friction members extend 60° circumferentially about the operator and handle section **172**. Accordingly, the caregiver experiences resistance for the first 60° of operator rotation from the unlocked position to the locked position. The full operator stroke can be 90°, such that the final 30° of rotation can be accomplished with little or no resistance. Advantageously, the frictional forces are ergonomically friendly, as the strength in the caregiver's thumb is typically strongest during the first 60° of rotation, and weakest during the final 30° of rotation. The friction members can provide enhanced resistance to rotation in only one direction if desired, such that resistance is only increased when the operator **204** is rotated from the unlocked toward the locked position.

The brake assembly **202** will now be described with reference to FIGS. **9-10**. The brake assembly **202** is illustrated as being operatively associated with one of the wheels, for instance a rear wheel **106**, and can be actuated to a locked position whereby rotation of the associated wheel is prevented. The brake assembly **202** thus prevents the stroller **100** from traveling along the ground surface when the brake assembly **202** is locked.

The rear wheel **106** includes an outer ground-engaging surface **260**, for instance a tire. A plurality of outer spokes **262** extends radially between a hub **264** and the tire **260**. A plurality of inner spokes **266** extends radially within the hub **264**. Gaps **268** are disposed between adjacent inner spokes **266**.

The distal end of rear leg **146** is closed via a plate **272**. An aperture **274** extends axially through the plate **272** that is sized smaller than the sheath **216**, but larger than the cable **214**. The cable **214** thus extends through the aperture **274** while the sheath **216** is anchored to the plate **272**.

The brake assembly **202** includes a bracket **270** supported by the frame **102**. A spring seat **276** extends inwardly from the distal end of the bracket **270**, and is connected to one end of a biasing member, such as a coil spring **278**. The coil spring **278** is connected at its opposite end to a second spring seat **280** disposed upstream from the first spring seat **276**. The second spring seat **280** is connected to a cable retainer **282** that is movably supported within a guide **284** extending axially out from the plate **272**. The guide **284** can extend along the lower surface of the cable retainer **282**, and can further extend partially or fully upwardly adjacent the opposing sides of the cable retainer **282**. The cable retainer **282** includes a rectangular groove **286** that receives a slug **246** connected to the distal end of the cable **214**. Accordingly, as the cable **214** is extended and retracted, the cable retainer **282** is likewise extended and retracted.

A latch **288** extends axially out from the cable retainer **282**, and is radially aligned with the inner spokes **266**, and thus also aligned with the gaps **268** disposed between adjacent spokes **266**. Accordingly, when the brake assembly **202** is locked, the latch **288** extends along the direction of Arrow C into one of the gaps **268** (shown in phantom in FIG. **10**), and the resulting interference between the latch **288** and the spokes **266** prevents rotation of the rear wheel **106** and movement of the stroller **100** along the ground surface. When the brake assembly **202** is in the unlocked configuration, the latch **288** is removed from interference with the wheel **106**, and the wheel **106** is therefore free to rotate, thereby facilitating unencumbered movement of the stroller **100** along the ground surface. The spring **278** imparts a force against the second spring seat, and thus the cable retainer **282** and latch **288**, that biases the latch **288** towards the locked position.

While the brake assembly **202** has been illustrated and described in accordance with one embodiment, one having ordinary skill in the art will appreciate that the brake assembly **202** could comprise any number of structures and configurations that are capable of causing the directional forces of the motion transfer mechanism **206** to lock and unlock the brake assembly **202** in response to actuation of the brake operator **204** without departing from the spirit and scope of the present invention.

Referring now to FIG. **11**, the brake assembly **202** is illustrated as being associated with the front wheel assembly **108** in accordance with an alternatively embodiment. Specifically, the brake assembly **202** can be actuated to a locked position whereby angular motion of the front wheel assembly **108** is prevented such that the angular orientation of the front wheels **109** cannot change. The brake assembly **202** can thus cause the stroller **100** to travel in a straight, linear direction along the ground surface when the brake assembly **202'** is locked.

In particular, the support **130** is pivotally connected to the stroller frame **102** via the frame bracket **194**. Specifically, a pivot connector **289** can connect the support **130** and the frame bracket. A recess **291** is formed in an upper surface of the support **130** at a location spaced from the bracket **194**. The recess **291** extends in a direction having a vertical component (angled with respect to the vertical, as illustrated). The brake assembly **202** is mounted onto the undersurface of the lower end **142** of the spine **140**, and operates in the mannner described above. Accordingly, when the brake assembly **202** is locked, the latch **288** extends into the recess **291** and prevents the support from pivoting about the bracket **194**. When the brake assembly **202** is unlocked, the latch **288** is free from the recess **291** and the support **130** and associated front wheels **109** are free to pivot about the spine **140** to change the angular orientation of the wheels **109** and correspondingly steer the stroller. It should be appreciated that an axially extending slot can be formed in the guide **284** that slidably receives the spring seat **280**.

While the brake system **200** has been described in combination with one of the rear wheels **106**, the present invention contemplates that the brake system **200** can be associated with either or both rear wheels **106** and the front wheel assembly **108** either alone or in combination. For instance, as illustrated in FIGS. **12**A-B, a brake assembly **202** of the type described above is associated with both rear wheels **106** and the front wheel assembly **108**. The cable assembly **112** thus extends from the brake operator **204**, through the handle section **172** and stanchion **176**, and partially into the spine **140** where the sheath **116** is anchored to a plate **117** connected inside the spine **140**. An aperture **119** extends through the plate, and the cable **114** extends through the aperture **119** and is connected to a plurality of cable segments **300**, **302**, and **304** that extend to the brake assemblies **202** disposed at the rear wheels **106** and front wheel assembly **108**, respectively. The cable segments **300**, **302**, and **304** can include a cable surrounded by a cable sheath in a manner understood by one having ordinary skill in the art. The distal ends of the cable segments **300-304** are connected to the corresponding brake assembly **202** in the manner described above.

Accordingly, actuation of the operator **204** causes the cable assembly **112** and all cable segments to actuate the corresponding brake assemblies **202** in the manner described above. It should be appreciated that one or all of the cable

segments **300-304** can be provided to operate either or both rear wheels **106** and the front wheel assembly **108** either alone or in combination. As described above, the driving rotation or the angular orientation front wheel assembly **108** can be controlled by either brake assembly **202** or brake assembly **202'**. Alternatively still, the brake assembly **202** can be used to prevent adjustment of the angular orientation of the front wheel assembly **108** in the manner described above.

Although certain embodiments have been described herein in accordance with the teachings of the present disclosure, the scope of coverage of this patent is not limited thereto. On the contrary, this patent covers all embodiments of the teachings of the disclosure that fairly fall within the scope of permissible equivalents.

What is claimed is:

1. A stroller comprising:

a stroller frame supported by rotatable wheels;

a brake assembly supported by the frame and operably coupled to one of the rotatable wheels;

a brake operator operably coupled to the brake assembly; and

a handle connected to the stroller frame and having two handle sections each curved inward toward the other and terminating at a free terminal end spaced laterally across the stroller frame from the other,

wherein movement of the brake operator to a brake position causes the brake assembly to retard rotation of the wheel, and wherein the brake operator is rotatably affixed to the free terminal end of one of the handle sections,

wherein the brake operator further comprises

a knob with an outer collar receiving an outer surface of the terminal end of the handle sufficiently loosely such that the outer collar and the outer surface can rotate relative to one another,

an elongate groove on the outer surface,

a channel extending in the terminal end of the handle,

a neck oriented axially between axial ends of the knob, and

an elongate channel extending into the neck and terminating at an aperture, the aperture anchoring the cable at a mouth of the channel,

wherein the cable extends along the elongate channel, the groove, the channel in the terminal end, and to the brake assembly.

2. A stroller according to claim **1**, wherein the brake operator is rotatable about an axis of the handle.

3. A stroller according to claim **1**, wherein the rotatable wheels include two rear wheels and wherein the two rear wheels are locked from rotating when the brake operator is in the brake position.

4. A stroller according to claim **1**, wherein the knob is rotatable and provides tactile feedback to a user when rotated between the brake position and a release position.

5. A stroller according to claim **4**, wherein the rotatable knob includes a plurality of circumferentially spaced and axially extending grip surfaces.

6. A stroller according to claim **1**, wherein the knob is a rotatable continuation of the handle.

7. A stroller according to claim **1**, wherein the one wheel is rotatable about a wheel axle and the brake assembly retards rotation of the one wheel about the wheel axle.

8. A stroller according to claim **1**, where the one wheel is rotatable relative to a generally vertical swivel axis and the brake assembly retards rotation of the one wheel about the swivel axis.

9. A stroller comprising:

a stroller frame supported by wheels;

a brake assembly operably coupled to one of the wheels;

a stroller handle extending along an axis; and

a brake operator operably coupled via a cable to the brake assembly and carried on the handle,

wherein the brake operator is rotatable about a rotation axis coaxial with the axis of the handle, wherein rotation of the brake operator to a brake position causes the brake assembly to retard rotation of the one wheel, and wherein the cable is routed through an interior of a frame tube of the handle,

wherein the brake operator further comprises

a knob with an outer collar disposed at a free terminal end of the handle, the outer collar receiving a necked-down outer surface of the terminal end sufficiently loosely such that the outer collar and the outer surface can rotate relative to one another;

an elongate groove on the necked-down outer surface;

an elongate interior, centrally disposed cylindrical wall in the terminal end of the handle;

a channel extending adjacent the cylindrical wall;

a neck oriented axially between axial ends of the knob; and

an elongate curved channel radially extending into a circumferential surface of the neck and terminating at an aperture, the aperture anchoring the cable at a mouth of the channel,

wherein the cable extends along the elongate curved channel, the groove, the channel adjacent the cylindrical wall, and to the brake assembly.

10. A stroller according to claim **9**, wherein rotation of the knob toward a release position spools the cable around the neck via the curved channel, thereby drawing a distal end of the cable from the brake assembly.

11. A stroller according to claim **9**, wherein rotation of the knob toward the brake position unwinds the cable from the neck via the curved channel, thereby allowing the distal end of the cable to move toward the brake assembly.

12. A stroller according to claim **9**, wherein the channel adjacent the cylindrical wall guides the cable along the axis of the handle frame during rotation of the knob.

13. A stroller according to claim **9**, wherein rotation of the knob about the axis of the handle results in linear movement of the cable.

14. A stroller according to claim **9**, wherein the brake operator includes an anti-rotation mechanism which maintains the brake operator in the brake position or in a release position when selected.

15. A stroller according to claim **9**, wherein the one wheel is rotatable about a wheel axle and the brake assembly retards rotation of the one wheel about the wheel axle.

16. A stroller according to claim **9**, where the one wheel is rotatable relative to a generally vertical swivel axis and the brake assembly retards rotation of the one wheel about the swivel axis.

17. A stroller comprising:

a stroller frame supported by wheels;

a brake assembly operably coupled to one of the wheels;

a stroller handle; and

a brake operator operably coupled via a cable to the brake assembly and carried on the handle,

wherein the brake operator is rotatable about an axis of the handle, wherein rotation of the brake operator to a brake position causes the brake assembly to retard rotation of

the one wheel, and wherein the cable is routed through an interior of a frame tube of the handle,

wherein the brake operator further comprises

a knob with an outer collar disposed at a free terminal end of the handle, the outer collar receiving an outer surface of the terminal end sufficiently loosely such that the outer collar and the outer surface can rotate relative to one another;

an elongate groove on the outer surface;

a channel extending in the terminal end of the handle;

a neck oriented axially between axial ends of the knob; and

an elongate channel extending into the neck and terminating at an aperture, the aperture anchoring the cable at a mouth of the channel,

wherein the cable extends along the elongate channel, the groove, the channel in the terminal end, and to the brake assembly.

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